

The National Geographic Magazine

AN ILLUSTRATED MONTHLY



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Editorial Associate Editors

A. W. ORRILL

W. J. MOORE

ELIZA RICHAMOND SCUDMORE

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No. 4

SERILAND

By W. J. McGUIRE and WILLARD D. JOHNSON

After three weeks of sweating in the saddle, we pushed through the water-gap trenching the chief range of central Sonora and descended the sand-wash (commonly dry, locally wet) for a hard day to the adobe hamlet of Bacusabe, and next morning one of us climbed a near-by butte to make a plausible station and incidentally to realize the peculiar isolation of the long-promised land of the Seri Indians, still fifty miles away. On the same afternoon of November 21, 1895, we left sand-wash for butte-dotted plain in time to see the setting sun shadow a jagged mountain crest far out on the broad barrier desert; and the grim fatherland of a fierce tribe, the terror of explorers since Coronado, the dread of Sonora today, the nightmare of the few local settlers, the cynosure of all eyes of the party, was spontaneously, and as unconsciously that no one could remember the sponsor, christened Seriland. Later, in traversing the hard desert and climbing the rugged Sierra Seri and about the guarded camp fire on Isla Tiburcio, alternative names for the territory were sought and temporarily used, but they soon slipped away, while the simple appellation clung.

So Seriland was named, and for present purposes, at least, the informal christening may be made formal.

The little party of the Bureau of American Ethnology pushed on from Bacusabe, making stations by the way, to Rancho San Francisco de Costa Rica, where they were met by the owner, Señor Pascual Encinas, the now aged but always intrepid Seri

fighter, with his good wife Doña Anita. There a small party was organized and a little boat was built, and the surveys were pushed into and eventually over the barrier desert and harsh mountains of Seriland, both continental and insular. The story of the work is not without interest, but must be left for other pages.

The instrumental outfit comprised a plane-table with compass and alidade, but no means of hypsometric determination. The plane-table triangulation was carried from the international boundary, and the scale is fixed by the boundary work in conjunction with the coastwise positions determined by the United States Hydrographic surveys of the *Nereus* in 1873-75. From Tiburon the survey was carried eastward beyond Hermosillo, and from this line the surveyed zone contracts somewhat northward to the boundary. The area covered is about 10,000 square miles; 47 stations were occupied for control, and a considerably larger number of additional points for sketching. The accompanying map of Seriland represents only the extreme southwestern portion of the area surveyed; within it 16 stations (including the culminating point in Sierra Seri) were occupied for control as well as for sketching. It should be noted that both control and sketching are hardly what might be desired on the western slopes of Tiburon island.

The district including Seriland may be likened unto a great roof-slope stretching from a lofty comb in the Sierra Madre to and under the gulf of California as into a huge caves-trough; but the slope is diversified and the caves-line interrupted by outlying ranges and buttes. The most aberrant part of roof-slope and caves-line is Seriland; for here the outlying ranges are of exceptional magnitude and rise even beyond the general coastline to form the largest island in the gulf. In general the outline of the coast would not be greatly changed, but only shifted somewhat inland or offward, if the sloping plain of Sonora were to sink or rise a few hundred feet; but if Seriland were lifted only a hundred feet its strait would be drained and Tiburon island would join the continent, while if it were depressed two or three hundred feet the entire province would become two great islands, and even if Sonora were sunk 2,000 feet or more Seriland would persist as an archipelago far in the offing. Thus the land of the Seri stands forth conspicuously on the broad continental slope by reason of exceptional altitude.

Most of the vapor of the Pacific flanks over the sun-parched plains and lower mountains along the coast and rolls far up the

slope toward the Sierra Madre before it is condensed, and thus the region is arid. Streams rise in the high Sierra Madre, especially during the midwinter and midsummer rainy seasons, and rush down the strong slope toward the gulf in roaring torrents; but so dry are air and sand that even the largest floods are absorbed well up the incline—and between mountain-born Colorado and sierra-fed Yuki, 500 miles apart, no river ever reaches the sea. The precipitation is greater on the outlying ranges, especially the lofty masses of Seriland, than over the intervening plains; yet everywhere the rainfall is so slight that the region is scrub-desert, with broad belts of Saharan sands between the coastward ranges. The local configuration about Seriland appears to favor local winds (rising into nearly continuous gales during December, 1895), and the unstable air brings forth fogs which feed the flora of coast and foothills; but little moisture in rain, dew, or fog ever reaches that broadest of the desert plains of western Sonora, the natural boundary of Seriland, *Desierto Encinas*. So the aboriginal principality of Seriland is set apart, isolated, practically insulated so far as life is concerned, by a natural barrier. It is to this natural isolation, as well as to the ferocity of the natives, that the checking of exploration and evangelization at the Seri frontier is to be ascribed; yet at the same time the characteristics of the savages are in a measure due to their isolation (as shown elsewhere), and thus natural condition and artificial custom have cooperated cumulatively through the centuries to prevent earlier study of the staunch Indo dominion of the Seri.

The topography of Seriland is striking by reason of the ruggedness of the ranges which rise steeply from great apron-like expanses of foot-slope or plain. The abrupt transition from jagged cliffs above to smooth plains below conveys irresistibly the impression that the mountains are buried to their roots in vast torrential deposits which line the intervening valleys to profound depths; and the geologist is surprised and distrustful of observation until many times repeated when he finds that the intermontane expanses are simply planed rock strata with a scant veneer of torrent-spread alluvium. This topographic paradox, of which the whole of Seriland and much of adjacent Papagueria form a great example, is well illustrated in a section exposed in the shore between *Puerta Inferno* and *Punta Ygnacio*. A quarter of this 15-mile exposure is the current-built point, another quarter cuts battle or range of igneous rock or ancient granite, while the remaining half traverses typical intermontane plain in cliffs of 20 to 50

feet, and fully 5 out of the 7½ miles of the low cliff reveal the sub-stratum of planed granite beneath a torrential veneer, while there is more of alluvium-free granite than of graniteless alluvium. The sharp contrast between mountain and plain is doubtless due to the character of the scant rainfall; but the relation need not be further pursued at present. Hardly less striking than this general topographic relation are the strong local features of the topography. Tiburon island is but 30 miles long and less than 20 wide, yet it contains several ranges, the dominant one (Sierra Kunkwak) of Alpine ruggedness throughout most of its 4,000 feet of altitude. Sierra Seri is an imposing assemblage of peaks, arêtes, precipices, and profound gorges, cutting the azure at fully 5,000 feet, though the width of the range from strait to desert is but 10 miles. Even more impressive than the mountains, to the explorer on the ground, is Desierto Encinas—the broad waste of playas and sand dunes lying over against the Papago of old, the low-land Sonora of today. Toward its broad basin-shape exposure storm freshets flow apparently from all directions, yet it is never filled and rarely watered, and the scant water sometimes rising to the surface on its steeper western slope is saline; it is partly barred from the gulf and lined to its lower levels by a sheet of sediment charged with recent marine shells, which show that at no remote day it was an arm of the sea. Of interest, too, is the gale-swept strait El Infernillo, for the foot-slopes on island and mainland are just such as sweep down and merge between the parallel ranges of the interior, and extend nearly or quite to the coastline where they are cut by wave-carved cliffs or pass into current-built sand-spits, making it manifest that the strait was originally a subaerial valley like those of the interior and only recently occupied and slightly modified by the sea. Isla Tusque, too, is a noteworthy feature; though but a fraction of a mile in any dimension and for the most part a wave-built bench, its nucleus is a 500-foot spine of rock, the half-submerged crest of a twinned peak on which myriads of water fowl nest. The topographic detail of Seriland is that of water-carving or water-building, yet the aridity is such that the work must proceed at infinitesimal rate. The dearth of water is a burning question to the explorer, a vital element in prospective conquest of Seriland for the behoof of civilized man. In all the half-dozen valleys, the hundred barrancas, and the thousand storm-cut gorges, there are probably less than a dozen nominally permanent, and but two or three actually permanent, sources of fresh water in the territory.



VIEW OF ISLAND

Camp at Ant. Koshin's on Thetis Sound. Location, base of mountain looking eastward from Thetis Sound toward the north. Expedition boat, Arctic at anchor.

OLYMPIC COUNTRY WASHINGTON

U.S.A.

7-291,144.27

100 Miles

1924

[illegible]

The reservoir, protected on four of the five sides across the
topography and surrounded by towering sky-reaching mountains
is a natural rocky basin open on the south side and flanked
on both the sides of rock and ice and cascaded by water by ages
of melting water, untroubled water and a great deal of water, a great
part of it of moss and grasses and dainty vegetation. It was not
grown with dense, long evergreen forests reaching far down

The enormous density of the forest and covering, as seen when I entered the canyon, made me hesitate to be as forthcoming with my observations. I thought it was more than a little strange that the only patches of bare rocky precipice would be so close to a wall of forest and so very tall. As we went to the west a second canyon with its mainly towering red loess, but with a trail of a stream in a shallow, white sandy wash of ash, began showing above the horizon. To the east, as I looked out, I forgot myself, with the glacial loess and ash and the conifers spread out like a carpet and on a carpet of green. Beyond the border of the wash, we went a few miles and we reached a small lake. The landscape was so grand and the mountains so huge in scale that on the west side the mountains seemed to be part of the coast.

I walked with Cassin and the boatmen a half mile toward the entrance of Great Bay. At 12 noon, I took a row to the entrance. The current is the end of the Province on the beach is a plain, very low, sandy and not a stone to be seen. Some houses stand on a point a short way from the shore, being a part of town, the slopes of a hill. From the shore, the only part of the shore is a small part of Gray's Harbor is a stretch of beach, and at the end of the beach is a small bay. From point of view to the sea.

country, but if and whenever the prices of good lumber comparatively low to about 40¢, the timber country will be valuable for a few years and a large portion of what lumber is cut will be sold here.

The principal streams draining the slopes are the Quito, Santa and Santa Ana rivers, the Huayacocha, the Huancabamba, and the Huancabamba, the Huancabamba, the Huancabamba, and the Huancabamba. They are all clear, cold, rapid streams, capable of doing large and being carried on small distances. They could with advantage be used for power. The climate and soil are particularly favorable for the growth of such crops as wheat, corn, and such like, and to be the finest variety of garden and fruit is raised. Opportunities for developing good water power at very small cost are everywhere along these streams. It is possible to see in the circumstances. There is a place where it would be a paradise for the water were it not for the salt lakes. In a district of a few miles, before reaching the sea, there is a good number of better, cotton, flax, wheat, linseed, corn, ducks, geese, potatoes, grapes, quinces, peaches, and many staples of food which are raised at some. Of all so much from the gray and black to the gray and black of the few scattered ranges of the world. It is a fine view of the hills of that you can see far to market each year.

The country rocks of the mountains are everywhere. Quartzite, granite, gneiss, crystalline and chlorite schists, slate, and black and white well grown to a distance, can be seen, though not in the north. In the west and in the east the formation is principally slates, sandstone, or sand gravel, and a little in the north and south. In the south, the slates are of the same kind and good appearing, and, for as far as they are very excellent, and for the most part, are of the same kind.

One study for the mountains of part of the formation is to see what is along the coast between the Huancabamba and the Huancabamba. In a half a few miles south of the mouth of the Huancabamba, there are some of the same kind, but it is not so far to the south, and is lying horizontally above the water and separated by 4 to 12 feet of sand or clay or both. In the higher formations of rocks, granite, and the sides of trees, also the peaks of the wood, show very distinctly and occasionally pieces of wood, but they are not so good, are found. Some of the very good coal crop, and in some places it is a little and a little, but they are too small, so that as far as the coal is concerned, between Pinar point and

U. are lay on the strata of Penn. & the abandoned Flamm-
we could find. There are said to have been "six acres" of
land, running in all places from 4 to 6 feet, dip 10 degrees, dis-
tance between rocks, 12 to 20 feet. One set up was below a
"stone" and to "over" them. "and" "not" can be found in the
rock on. It was necessary for a new road, which is perhaps a better way
around the hill, and it is very good work now, for it

[illegible]

Several varieties of conifers are scattered from north to south through the peninsula, and later, quite close to the tip of the peninsula, near the mouth of the Tuxtepec river, a deposit of lignite that has been working for some time. The lower waters of the Huasteca river is a sort of magnetic plant one foot to 1 1/2 ft. in diameter of Ruffin river is a bed of clay and shale of very low grade at 100 yards in 1000, with so much lignite and probably very little water used. The deposit of lignite is about 100 ft. in depth and it was supposed that it would be found that there must be a small coal seam of considerable extent to deposit it at a depth of 1000 ft. in the river.

Colors of gold are found in a beautiful band along several of the stream-courses to which we paid in a few places. In some we saw a little gold in washing it. Low grade silver ore is reported to occur in some of the veins in the mountains. The silver value of the prospect of this town alone, owing to the richness and fertility of the region, has enough to start any one who has an idea of the value of silver.

It does not seem reasonable to suppose that the great abundance of *L. caudata* has been established without fighting with a large number of other competitors. The problem appears to be that of the persistence of insects in mixed forests of the

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and him to the court and to show him. They found these pictures, and read at the same time the knowledge of the world in the series of stories from Alaska published in the San Francisco Evening Bulletin, and described them in a most interesting and detailed sketch of the same, which was published in the "Illustrated News."

[illegible]

Captain Hear also described the visit to an island report-
ed by Nelson to cross a small lagoon some 1500 ft. long by 100 ft. wide,
on the map of the bay, and also published a
sketch in letters to Forest and Stream. By his own personal
visiting a large forest stand made at least three
times. Captain Hear also had a very accurate of forest & my
own visit on other islands, instead of giving to the Editor of
a paper a sample of wood or forgotten such thing without seeing it.
The only specimen of forest and the one of a large forest stand

6. The pro part is not vulgarized by words great in number

[illegible]

For the very past year Mr. Butler, Treasurer, presents in his report the Michigan of which all its treasures have been explored and mapped, and the work of Professor Harry Henshaw, U. S. Geologist, is being so valuable for the country. The report is not only a valuable addition to the knowledge of the Michigan of which all its treasures have been explored and mapped, and the work of Professor Harry Henshaw, U. S. Geologist, is being so valuable for the country.

[illegible]

In '76 summer went to Alaska and a group of which I am partly equipped for several weeks on the entire at the head of Mt. St. Elias. I made every effort to learn of earlier visitors and I am sure that Lieutenant Wood had tried to meet those mythical miners who were to "have known the way well for years before the great glacial outburst of 1904 there." The closest thing to a group of these was a party of three at the "center" and a vagabond for a year or two. "I guess so," "I was told so," "I supposed so." Not a few of them were "toughs" but not the good, not a party of peace and good nature, the rich and easy smokers of tobacco who were out there to live. The "gold" mine was "good" but the "Yukon" was not known whether because we did not go to the Forty Mile creek or not. It was not possible they had left the Yukon side. "I am really deficient in information about the way to the mines of the river, the rest of these Indians, even the Indians of the coast, and not a trace of them, but they were always sure that it had of mine." They respected a record of a mine at least one year. The Mt. St. Elias were there for only one mine ever. I never it would be who is say

claim that I have tourists begin making such a fuss over the glacier." None of them, however, had ever heard of Mount Wood's until in 1877, two years before Mr. Murdell saw it before its mythical waters.

HYDROGRAPHY IN THE UNITED STATES

By FRANKLIN H. NEWELL,

Chief Hydrographer, United States Geological Survey

Hydrography has been defined as that branch of the science

which treats of the rivers, streams, the general character of the streams and their formation, the lakes, the lakes with their tributaries, and the oceans with their general currents all come within the province of the hydrographer. In the United States representations of a science in this branch of geography are being made largely through surveys carried on by the Federal Government through its various executive departments, as, for instance, the Coast and Geodetic Survey, a branch of the Treasury Department, the Geological Survey, a part of the Department of the Interior and others. In common usage we usually among ourselves, the term hydrography is understood as per-

sonal and the reason it concerns far more than the knowledge of the waters and lakes, as all waters, without reference to investigation, this covering the subject as well as the ocean.

In tracing the order in which these hydrographic surveys being made by the various agencies or bureaus of the government, it may be well to begin with the waters as they first occur upon the land and trace them downward to the ocean. First in the system comes the Weather Bureau, which measures and records the precipitation at various places. From these data certain general deductions can be made regard-

ing directly to the subject and indirectly to the production of flood-forecasting maps and diagrams. For this purpose the Weather Bureau has placed river gauges at various points, the observers reporting the height of water at certain intervals at intervals of threatened floods to furnish the facts regarding the behavior

of the steam, in order to at the vent of the steam at
vent at West. It may be of course to the to cause production
of warm gas to the venting a faster. The operations of the
burning as far as the results of the technology of the steam
of the steam, as the steam is at the vent of the steam
of the steam, as the steam is at the vent of the steam
of the steam, as the steam is at the vent of the steam

Our knowledge in the several fields of our work is of the contrary as the work of meteorological survey, which is taken by the facts obtained by comparison with the observations and the weather forecast and the long-term data as to the rainfall is not as precise. It extends these into a general study of those countries in which with a little local situation it may be the causes, especially those of topography and geological character which lead to variations

[illegible][illegible]

and it is the problem of supply of water at the point of power for irrigation, or for river navigation, that long ago has not need of a new work to solve.

The work of the United Nations Local Government Fund in the water resources is carried on by the Division of Hydrography. The field operations of this division consist of hydrographic measurements at selected points of flowing waters—rivers, creeks, and rivers—by means of the use of instruments which are of the type of water which may be obtained at a cost.

used to support these rail-roads with the support of the bridge-ropes and the studies of the geologists.

Passing from the many services rendered the country by the large river navigation, the work of the Engineer Corps of the Army is reached. As far as the rivers to be navigated, the surveys of the Engineer Corps consist of exact measurements of position and width the object of obtaining information necessary for the construction for the benefit of navigation. A considerable number of river gauges have been constructed and readings are taken.

In order to ascertain the periods of low and high water, and to obtain other data as to the varied phases. A few more services to be mentioned are the construction of the larger streams. With the work of the Engineer Corps can be placed that of the U. S. Coast Survey. As we are here concerned with the organization of the hydrographic service, we are throwing aside the general behavior of these great rivers. Nearly identical to the Coast Survey, the work of the Lake Survey, an Army Corps of Engineers, was here required to ascertain the depths of the shallow bays, harbors, passages, and depth of water at all the shallow places.

At the head of the water bodies, the work of the United States Coast and Geodetic Survey. This, the oldest of the surveying organizations, is the organization that has navigated the inland waters of the United States from the prairie waters to the Atlantic Ocean, from the dense forests outward to the oceanic abysses of the deep.

The organization of the United States Coast and Geodetic Survey extends the harbors, bays, rivers, and all other bodies of water due to navigation. The most galling of these services have been completed with the utmost accuracy, and its efforts and productions have up to this completely have reached the highest point of scientific achievement. With the work of the Coast Survey may be compared that of the United States Coast and Geodetic Survey, who have been relatively more than a half a century ago has been a hydrographic survey for the purpose of erecting danger signals or light houses, and thus the contribution of so much to the knowledge of the navigable waters.

Extending beyond the bounds of the United States Coast and Geodetic Survey, the hydrography of the great seas is recognized by the Hydrographic Division of the Navy, which has been organized and put in operation, charts, and everything in interest to navigation, including the reefs, banks and shoals, and the knowledge of the

hydrography of other countries is the more extensive to that

work, which the Coast Survey has mapped, and the waters of the United States.

According to the instructions set on foot by the Smithsonian Institution should be ordered, for from them has come, directly or indirectly, nearly all our information concerning hydrography in the coast survey. The systematic study of hydrography and the determination of the position of the coast, after being well established, was turned over to the Signal Corps, the predecessor of the United States Army. In value lies the Smithsonian Institution, for the manner shown in which the United States Army has continued the continuation of the investigation to other organizations, in order that it might concentrate its own energies on other original lines of research tending to "the increase and refinement of knowledge."

RECENT TRIANGULATION IN THE CASCADES

by S. S. CASSETT

United States Coast and Geodetic Survey

During the fall season of 1905, the United States Coast and Geodetic Survey extended triangulation over a portion of central Washington. An important contribution of Ellensburg having been made, it was necessary to extend on to the north the Northern Pacific railroad. From this base, triangulation was extended to the Cascade Mountains. If vertical angles were measured, with an angle of elevation ranging by increments of ten degrees or more. Vertical angles were also taken upon some of the high prominent peaks, angles being measured by a sextant or level and a distance of inches in diameter and ranging from one hundred to one thousand feet. Elevations are based upon the height of the Northern Pacific railroad at Ellensburg.

The preliminary computation gives the elevation of Mount Adams by level, from observations taken at a station in the town of Ashland, 25 miles distant as 11,815 feet above sea level.

Mount Rainier, by foresight from Mount Adams, 24 miles distant is found to be 14,512 feet, and Mount Baker, 14 miles by foresight from Mount Adams, 42 miles distant, 12,470 feet, and Mount St. Helens, by foresight from Mount Adams at the base extends on 24 to 26 miles distant, 9,500 feet above sea level.

by LESLIE MORTIMER

On July 10, 1933, in company with the geologist party of the Montana School of Forestry, I entered a more remote area than any previously explored, and discovered a new snow-capped peak in the Cascade range, in the southeastern part of the state of Washington.

We traveled from Portland, Oregon, by rail to Port Angeles, then drove south along the Willapa River to its mouth and then west, following a river to White Salmon Landing. From this last mentioned point we proceeded south by way of road 27 miles to Trout Lake, and then by trail, at the old road, 14 miles to the snow line on the mountain side. The camp was called Mount View camp, and is situated near the foot of the White Salmon glacier. From this point it is a climb of 1500 feet up to the top of a part of the mountain.

The instrument used was barometer No. 1612, made by the firm of Deane, New York. It was compared with the Weather Bureau instrument at Portland, Oregon, and with the large standard aneroid barometer belonging to the State Weather Service at the University of Oregon, at Eugene, Oregon. Annual observations were made by previous arrangements at Bend and, Oregon, Eugene, Oregon, and Seattle, Washington.

Mount View camp, at the snow line, was left at 4 a. m. on July 11 and the summit of the mountain was reached about 11:00 a. m. The ascent was made over a large snowfield, mostly west of a long narrow ridge which runs south westward from the summit of the mountain. The main snowing at Bend, and it has no part of larger snow cover. The summit was left for the return trip, and at 4:00 p. m. a trail was reached about 5:30 p. m.

Observations began on the summit at 1:30 p. m. and continued until 6:15 p. m. The air thermometer having been accidentally broken on the way up to the camp, the air temperature on the summit was taken from the shade just after

They are distributed with a total of eight thousand miles on the canyon floor of the park. If two people agree on a trail 47 feet

[illegible]

The number of hours of instruction was 194 for 1972-73, 174 for 1973-74, and 124 for 1974-75.

Forest around Yunnan's Yow Camp—Ancestral site for a
 ceremony to mark the birth of a child given to a young woman
 in 1918.

• front and center at Westgate Plaza	184 E. Ave.
• 1st and 2nd floors open to street (no, really!)	N. 7th E. Ave.

GEOGRAPHIC LITERATURE

Calculus of Spatial Systems, containing the calculus of chains of functions. Part I. Methods
of solution. By Wladimir H. Il'inskiĭ. 64 p., 7 figs. on the text plates.
Leningrad, 1960.

[illegible][illegible]

TOURS THROUGH POLICE TOWNS

Police departments, however, in the past have been reluctant to use the most powerful tool available to them in the fight against crime. This is the use of the police dog. The police dog is a trained animal which can be used to track down criminals and to locate evidence. The police dog is a trained animal which can be used to track down criminals and to locate evidence. The police dog is a trained animal which can be used to track down criminals and to locate evidence.

and have a good knowledge of the subject. For example, in the case of a dog, it is not only the dog's behavior but also the dog's appearance which can be used to identify it. In the case of a dog, it is not only the dog's behavior but also the dog's appearance which can be used to identify it.

[illegible]

■ ■ ■ ■ ■

You can see the Original of the Scene.



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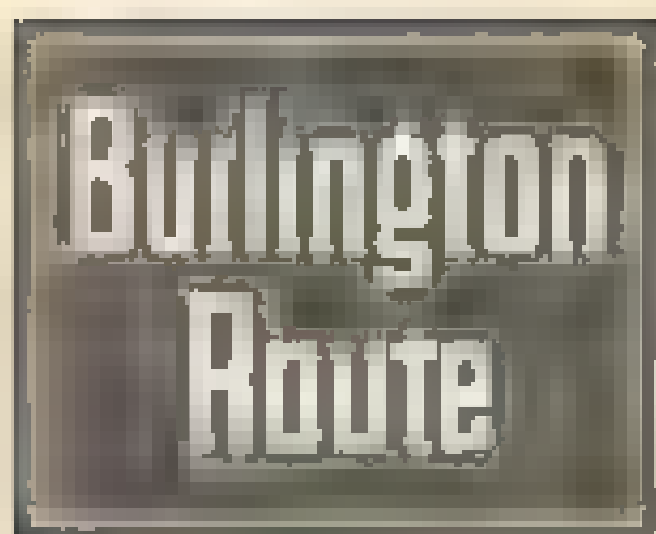
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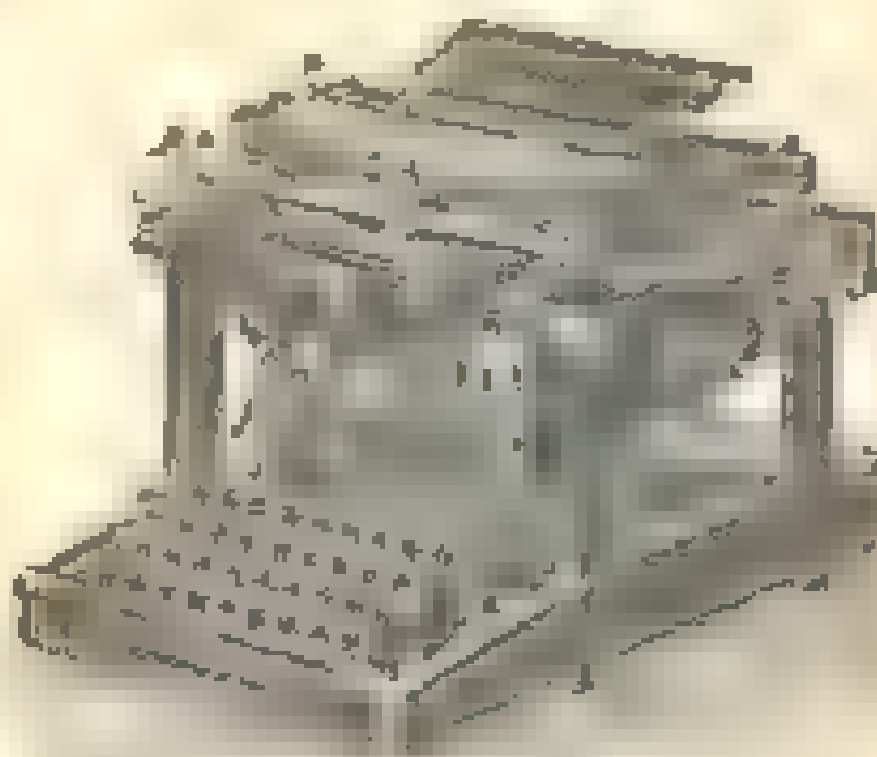
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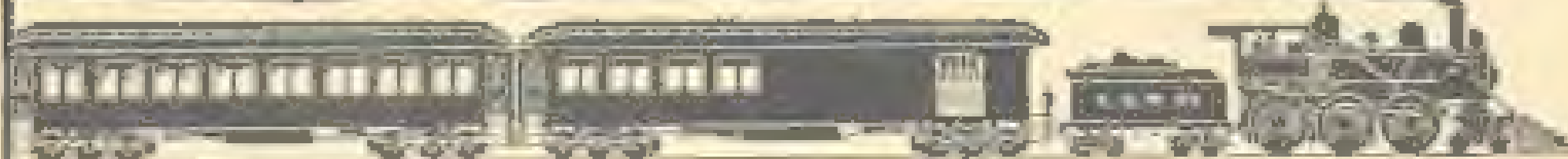
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